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REVIEW ARTICLE

Intimate Partner Violence Exposure and Self-Regulation in Children and Adolescents: A Systematic Review

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Abstract

Purpose Millions of U.S. households have children who have witnessed intimate partner violence (IPV) between their caregivers. The far-reaching negative influences of IPV on children encompass numerous psychological outcomes and delays in various domains of child development. Given the critical role of self-regulation in cognitive and social functioning, which is necessary for navigating complex social situations and academic success, investigating the impact of IPV on its development is of particular importance. Thus, the objective of this study is to conduct a systematic review of empirical research examining the relationship between IPV exposure and the development of children's self-regulation.

Methods This study systematically reviewed 13 peer-reviewed studies published between 2000 and 2021 that quantitatively examined the effects of IPV exposure on self-regulation in children and adolescents. Studies were found using selected keywords across four scientific databases.

Results Among the 13 studies included in the review, 10 studies identified significant negative effects of IPV exposure on various aspects of self-regulation (i.e., emotional regulation, executive function, and behavioral regulation), and two studies identified indirect pathways through parenting and maternal depression.

Conclusions Previous studies indicate that the normal development of self-regulation in children may be disrupted by stressful and conflict-ridden home environments. Further research is necessary to explore the mechanisms and timing by which IPV exposure influences the development of self-regulation in children, as well as protective factors that may mitigate IPV's negative effects.

Keywords intimate partner violence (IPV) · self-regulation · children · adolescent · systematic review

Introduction

Intimate partner violence (IPV) has been described as "physical, sexual, or psychological harm by a current or former partner or spouse" (Breiding et al., 2015, p11). In addition to IPV's broad impact on millions of adult victims, it is estimated that over 16.3% of U.S. households have children who have witnessed IPV between their caregivers. The negative influences of IPV on children are well-established and include increased risk of psychological disorders, behavioral problems, and delays in various domains of child development, especially cognitive and social-emotional development (e.g., Carpenter & Stacks, 2009; Evans et al., 2008; Howell et al., 2016). These patterns are consistent with the results of multiple systematic reviews that link IPV exposure with children's physiological functioning, specifically within the endocrine, nervous, cardiovascular, and immune systems (Berg et al., 2022), increased externalizing and internalizing problems (Fong et al., 2019; Vu et al., 2016), and lower levels of social competence and emotional regulation (Bender et al., 2022).

Self-regulation has been shown to be a mechanism through which IPV exposure influences many of the above-mentioned outcomes (Harding et al., 2013). Self-regulation is a multi-faceted construct that is generally defined as the degree to which individuals control their attention,

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emotions, behaviors, and reactivity to environmental stimuli (Kopp, 1982). Previous studies suggested that IPV exposure interferes with normative processes central to children's development of self-regulation, including elevated lack of awareness of emotion, more trouble in distinguishing emotions, lower capacity for articulating emotions and regulating negative affect, and lower abilities in using emotional reactions as signals to trigger useful coping strategies to handle distress caused by interparental conflict (e.g., Katz et al., 2007; Rigterink et al., 2010). There is also evidence that IPV exposure negatively impacts the development of executive function (Clark et al., 2021), which represent the higher-order cognitive skills at the top of the self-regulation hierarchy (Blair & Ku, 2022). However, some studies have failed to report a link between IPV and self-regulation (e.g., Ingoldsby et al., 1999; Maughan & Cicchetti, 2002). When comparing the sampling strategies between the previous studies with these contradictory findings, the link between IPV exposure and self-regulation seems to vary based on the timing of IPV exposure and the point in time that self-regulation was assessed in measuring self-regulation. Considering the divergent findings highlighted previously, it is crucial to undertake a systematic review of the literature to thoroughly assess the effects of IPV exposure on different facets of children's self-regulation (Montroy et al., 2016). Such a comprehensive systematic review, through synthesizing findings from multiple studies and across multiple facets of self-regulation, would provide valuable insights to help foster the development of self-regulation among children who have been exposed to IPV.

Conceptualization of Self-Regulation

Self-regulation is an umbrella term that typically encompasses specific components such as executive functioning, emotional regulation, and behavioral regulation (Nigg, 2017). Self-regulatory processes represent a critical construct that has important consequences for developmental trajectories and has been widely investigated in multiple disciplines (Nigg, 2017). For example, researchers from the mental health field approached the study of self-regulation from the perspective of exploring the behavioral symptoms that underlie attention deficit and hyperactivity disorder (McCoy, 2013). Researchers in the criminal justice field observed that the lack of self-regulation (often referred to as "self-control") played a central role in explaining delinquent behaviors (Boutwell & Beaver, 2010). Developmental neurobiologists emphasized the underlying cognitive processes (often termed "executive function") and emotional reactivity that contribute to the manifestation of self-regulation, which could be understood through the observation of physiological central regulatory systems such as electrodermal responses, vagal tone, heart rate, and brain activities (Werchan et al., 2022). Developmental psychologists posited that self-regulation was reflected in children's abilities to follow everyday customs and norms that are implemented in social contexts to guide appropriate behaviors such as compliance and delayed actions (Montroy et al., 2016). Thus, self-regulation has been a critical and common thread across literature examining childhood psychological and neurophysiological processes.

Blair and Ku (2022) recently proposed a comprehensive hierarchical integrated model of self-regulation, which highlights the interrelatedness of cognitive, emotional, behavioral, physiological, and genetic levels. According to their perspective, self-regulation serves as the overarching construct that encompasses these distinct components. Within this hierarchical framework, executive function is positioned as the cognitive component at the highest level of the integrated model. This approach recognizes the reciprocal and recursive relationships among the cognitive, emotional, behavioral, physiological, and genetic aspects of self-regulation, providing a holistic understanding of its functioning and organization. Taking into account this recent theoretical perspective and integrating knowledge from various fields, this review adopts a perspective of self-regulation as an overarching construct that includes three key developmental aspects: cognitive, emotional, and behavioral. These aspects enable individuals to regulate their thoughts, emotions, and behaviors, respectively, in order to achieve their goals (McCoy, 2013).

Theories Guiding this Systematic Review

Informed by attachment theory and emotional security theory, this systematic review aims to explore the development of self-regulation among children who were exposed to IPV. Attachment theory and emotional security theory are two theories that support the link between IPV as a hostile home environment and individuals' behavioral outcomes via changed parent-child relationship and varied home affection levels. Attachment theory provides support in explaining the mechanisms on a family level that emphasize the role of the parent-child relationship in children's developmental outcomes. This theory specifies an understanding of how the qualities of the parent-child relationship could be eroded by IPV that, in turn, affects aspects of children's social and emotional development, including self-regulation, in the short and long term (Bowlby, 1988).

The formation of a secure attachment with at least one primary caregiver usually requires parental sensitivity and immediate responsiveness that start as early as a child's first several months after birth. Only with the presence of a secure base (attachment figures that are typically maternal)

can children feel comfortable exploring the outside world. Children seek comfort and external regulation of emotions from parents at an early age, and then these initial regulatory processes could be internalized into the inner self-regulatory system (Drake et al., 2014; McCoy, 2013). To regulate an infant's arousal, a parent must first be able to regulate his/her arousal states (Schore, 2005). The interactive communication of emotions between parents and children requires sensitivity and attention from the side of a caregiver. In the context of IPV, mothers often experience stress, fear, and trauma that may impact their parenting, leading to a reduction in maternal warmth (Chiesa et al., 2018; Davies & Cummings, 1994). The lack of a secure base when needed could immerse children in inadequate coping processes that leave them overwhelmed by negative emotions without ways of seeking external comfort and/or little interest in exploring the environment (Mueller & Tronick, 2019). Children in homes with conflict and violence could miss the opportunity to learn regulatory skills from the caregiver as well as opportunities to explore, learn, take initiatives, and cope with challenges independently, all of which are processes considered necessary in internalizing skills for self-regulation (Drake et al., 2014).

Building from attachment theory, emotional security theory emphasizes the need for a safe, warm home environment above the parent-child relationship (Davies & Cummings, 1994). This theory emphasizes children's sense of security and their evaluations of IPV, which are meaningful in impacting children's adjustment and wellbeing. In the context of this study, emotional security refers to the perception that children have of the emotional environment within their family, including the extent to which they feel secure and free from fear, conflict, and violence (Cummings et al., 2009). Children's exposure to the negative emotions of anger, fear, and hatred experienced by IPV victims may significantly impact their stress levels. Children's emotional and psychophysical reactions to IPV are based on the characteristics of the current conflict as well as past exposure (Cummings et al., 2009). In addition, the day-to-day chaos within the household and disrupted familial relationships could compromise children's sense of stability and safety, which are the premises for children to appropriately deploy attention and regulate emotions that are also daily practices, necessary for the normal development of self-regulation (Blair, 2010; Davies & Cummings, 1994). Children who are exposed to repeated high-level IPV are more likely to be emotionally insecure, as reflected in their lower capacity in regulating emotional and behavioral reactions (Cummings et al., 2009).

Drawing upon Bronfenbrenner's (1979; 1986) framework and existing research, more recently, McCoy (2013) proposed a comprehensive bioecological system model to elucidate the link between violence exposure and self-regulation. McCoy (2013) argued that violence could serve as a significant independent predictor of self-regulation development. Violence occurring within households, particularly when directed towards children's primary caregivers, had the most profound effect on children's self-regulation. This impact manifested in the unavailability of caregiver support during times of distress, hindering children's ability to self-regulate, as well as a lack of role modeling for ineffective self-regulatory techniques, impeding the development of cognitive schemas for self-regulation (McCoy, 2013). The observation or experience of violence between parents or caregivers creates an environment characterized by fear, unpredictability, and instability. Children may struggle with regulating their emotions, attention, and behaviors when constantly in a state of heightened alertness and lacking a secure and stable foundation. Moreover, direct exposure to interparental conflicts or victimization within the family places children at a heightened risk for dysregulated behaviors through maladaptive stress responses (McCoy, 2013). The continuous release of stress hormones resulting from IPV exposure is associated with reduced neural activity in the developing prefrontal cortex, responsible for cognitive processing, and increased activity in lower brain regions associated with automatic responses to negative emotions (McCoy, 2013; Taylor et al., 2006). Early exposure to IPV as a source of early-life adverse experiences, therefore, has more negative implications in shaping children's brain activities, connections, and functionalities that jointly influence the formation of early development of self-regulation capacities (e.g., Demir-Lira et al., 2016; Fox et al., 2010).

Drawing from this bioecological system perspective, it is imperative to understand the negative impact of IPV with the consideration of the timing of exposure. Children's development of self-regulation can be influenced by changes in parenting behaviors and styles resulting from IPV at various critical time points during childhood (McCoy, 2013). For instance, IPV exposure during infancy can compromise the development of self-regulation through disruptions in the formation of infant-mother attachment, which serves as a bridge connecting external regulation to internal regulation (Drake et al., 2014). Consequently, children may experience heightened levels of early psychosocial stress, which can adversely affect early brain development (Mueller & Tronick, 2019). During early childhood, when children are acquiring knowledge about different emotions, healthy cognitive appraisal, and appropriate responses to stressful situations, caregivers' overt and covert reactions to violence may shape children's reactions and regulatory abilities negatively (Farver et al., 2005; Roskam et al., 2014). Parents in chronically violent environments have shown tendencies to become overprotective, dominant, and authoritarian, which

restricts children's environmental exploration crucial for the development of self-regulation (e.g., Krishnakumar & Buehler, 2000; Levendosky et al., 2006). Overall, the timing of IPV exposure during early childhood could be most critical as it intersects with the period when self-regulation skills are rapidly developing (McClelland & Tominey, 2014). Early exposure to IPV may significantly disrupt the formation of secure attachment, impact brain development, and impede the acquisition of self-regulation skills, thereby making it particularly deleterious to children's overall development.

The Current Review

This review uses a systematic search and review methodology to synthesize empirical studies that examined the relationship between IPV exposure and self-regulation in children and adolescents. This review aims to (1) examine the effects of IPV exposure on various aspects of self-regulation, (2) examine the timing of IPV exposure and effects on children and adolescents, and (3) identify mediators and moderators of this association. This systematic review advances the understanding of the mechanisms involved in the IPV exposure to self-regulation link, and therefore offers directions for the development of effective and efficient prevention and intervention strategies to reduce violence exposure and to enhance self-regulation.

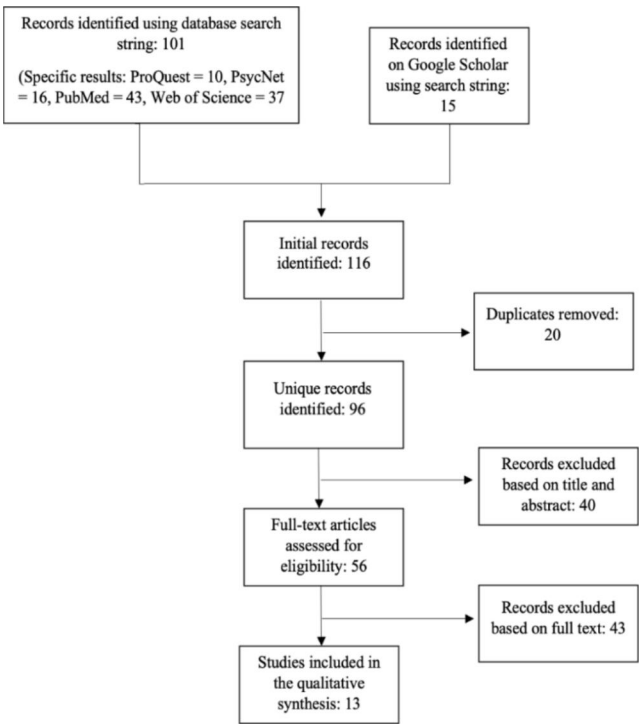

Fig. 1 PRISMA flow diagram of the study selection

Method

Eligibility Criteria

In this review, peer-reviewed, English-language published journal articles were searched in four scholarly databases that empirically examined an association between IPV and self-regulation in children. Children were defined to be between the ages of infancy (from birth) to 18 years old. We excluded articles that: (a) examined populations beyond the scope of the defined age range of children (b) examined another type of violence in the household or community that was not clearly defined as "IPV", "domestic violence", or any other term describing conflict within the family unit (i.e., physical abuse toward children and community violence); (c) examined outcomes that did not include self-regulation in the defined aspects (e.g., executive functioning, behavioral regulation, emotional regulation), and (d) the relationship between IPV exposure and self-regulation was not assessed quantitatively. We included articles that tested mediators and moderators of the relationship between IPV exposure and self-regulation.

Sources, Search, and Study Selection

The four scholarly databases included PsycNet, Web of Science, PubMed, ProQuest, and Google Scholar. The keywords related to violence include "intimate partner violence," "domestic violence," "family violence," and "adverse childhood experience." To capture aspects of self-regulation, the keywords used are "self-regulation," "emotional regulation," "behavioral regulation," "executive function," "inhibitory control," and "attentional regulation." The keywords specifying the target population are "children" and "adolescent." The first search took place from November 15th, 2021 to January 24th, 2022, and yielded 1,215 records. Information sources included were extracted from these scientific databases between the years 2000–2021. Articles were scanned by the second author based on title relevance to inclusion criteria; if deemed relevant, the abstract was used to further assess whether articles should be included. Using the same search strategy, a second search took place between June 29th, 2022, and July 30th, 2022, with the keyword "interparental conflict" being added. The full electronic search strategy for the two rounds of search at distinct time intervals is shown in Fig. 1. In the initial search, after screening on titles and abstracts, 93 articles were downloaded with 15 duplicates further removed. The full texts were then assessed, resulting in 11 studies meeting the inclusion criteria. In the second search, after screening titles and abstracts with the same eligibility criteria as the initial search, 23 articles were downloaded with 6 duplicates

further removed. After assessing the remaining full texts, 2 studies met the inclusion criteria and were added to the final list of selected studies, for a total of 13 studies.

Data Collection, Data Items, and Coding

Once the included studies were finalized, the first two authors of this study independently extracted pertinent research characteristics and reached agreements for the methodological quality analysis to include (1) study characteristics, including the age of exposure, the nature of the exposure, sample size, sample ethnicity, research design (cross-sectional, longitudinal, etc.), (2) theoretical frameworks, (3) measurements of IPV and self-regulation, (4) timing of IPV exposure and self-regulation assessments, (5) the examination of mediation and/or moderation effects of the relationship between IPV exposure and self-regulation, and (6) numerical results of the associations between IPV exposure and self-regulation. These study attributes were chosen to be the most important in order to accurately assess the quality of reviewed studies and the associated relationship between IPV and self-regulation. Thus, the first two authors followed these predetermined criteria and guidelines to extract information from the articles and independently code each article in the table. In cases where coding discrepancies arose, a third author was engaged to review the codes and resolve disagreements to reach a consensus. The resolution process involved a review of the notes and codes and discussion with the consideration of the differing perspectives, with careful attention given to the specific criteria and guidelines.

Assessment of Methodological Quality

Using the National Institutes of Health's (NIH, 2014) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies, we assessed the methodological quality of the included studies. This NIH tool contains 14 criteria evaluating the internal validity of a study, including reporting, procedure, research design, sampling, measurement, and data analysis (NIH, 2014). Following these criteria, articles could be rated as poor, fair, or good. Generally, with more criteria being met, a higher quality rating is granted. The 13 studies in this review were assessed by the second author in the current study.

Results

Methodological Quality of Studies

We first present the methodological quality of the studies. By thoroughly assessing the methodological rigor of each study, we aim to gain a comprehensive understanding of the overall quality of the evidence. No studies were rated as poor quality (failing to adhere to at least five out of the 14 evaluation criteria listed in the NIH quality assessment tool). Three studies (Halldorsdottir et al., 2019; Martin & Clements, 2002; Raver et al., 2015) were assessed as fair quality, while the remaining 10 studies were deemed good quality. Common strengths observed across the studies included clearly stating the research question or objective and accurately specifying the population of interest. For a detailed assessment of each study's quality, please refer to Table 1.

Characteristics of Included Studies

Table 2 provides a detailed sample and methodological characteristics of the 13 included studies. Of these studies, 3 utilized a cross-sectional design and 10 employed longitudinal designs. Overall, the majority (12 out of 13) of the included studies contained sample populations of children younger than age 10; only two studies included children aged 11–18 years old. Sample populations were also ethnically and economically diverse. Seven studies assessed for three or more racial identities (Clark et al., 2021; Easterbrooks et al., 2018; Katz et al., 2007; Maughan & Cicchetti, 2002; Miller-Graf & Scheid, 2021; Rigterink et al., 2010; Zarling et al., 2013). Three studies identified sample populations as either "Black" or "White/Caucasian" (Gustafsson et al., 2015; Halldorsdottir et al., 2019; Towe-Goodman et al., 2012). All included studies also took place within the United States.

We examined the theoretical frameworks employed in the included studies to gain a deeper understanding of their theoretical or conceptual underpinnings. This analysis also provides insights into the mechanisms and pathways through which IPV exposure may impact self-regulation in children. Among the 13 articles, six did not specify a guiding theoretical framework, six used the stress and emotional security theory, and one used spillover hypothesis (see Table 2 for the complete list of the studies and the discussion of these theoretical perspectives in the introduction of this review).

Table 1 Quality Assessment of Included Studies (N = 13)

Authors (year)	Criteria													
	1	2	3	4	5	6	8	9	10	11	12	13	14	Rating
Clark et al., 2021	+	+	?	+	-	+	-	+	-	+	/	+	+	Good
Easterbrooks et al., 2018	+	+	+	+	-	+	+	+	-	+	/	+	+	Good
Ehrensaft & Cohen, 2012	+	+	+	+	+	+	-	+	+	+	/	?	+	Good
Gustafsson et al., 2015	+	+	+	+	+	+	+	+	+	+	?	?	+	Good
Halldorsdottir et al., 2019	+	+	?	?	-	+	+	+	+	?	?	?	+	Fair
Katz et al., 2007	+	+	+	+	-	+	+	+	+	+	/	?	+	Good
Martin & Clements, 2002	+	+	?	+	-	+	-	+	-	+	-	/	-	Fair
Maughan & Cicchetti, 2002	+	+	+	?	+	-	+	+	-	+	/	/	+	Good
Miller-Graf & Scheid, 2021	+	+	?	+	-	-	+	+	-	+	/	+	+	Good
Raver et al., 2015	+	+	+	+	+	+	+	+	-	+	?	?	+	Fair
Rigterink et al., 2010	+	+	+	+	-	+	-	+	+	+	/	+	+	Good
Towe-Goodman et al., 2012	+	+	+	+	-	+	+	+	-	+	?	-	+	Good
Zarling et al., 2013	+	+	+	+	+	+	+	+	-	+	?	+	-	Good

Note. Studies are listed chronologically by date of publication. According to NIH (2014) quality assessment tool: "Criteria 1: Was the research question or objective in this article clearly stated? Criteria 2: Was the study population clearly specified and defined? Criteria 3: Was the participation rate of eligible persons at least 50%? Criteria 4: Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants? Criteria 5: Was a sample size justification, power description, or variance and effect estimates provided? Criteria 6: For the analyses in this article, were the exposure(s) of interest measured prior to the outcome(s) being measured? Criteria 8: For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g., categories of exposure or exposure measured as continuous variable)? Criteria 9: Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants? Criteria 10: Was the exposure(s) assessed more than once over time? Criteria 11: Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants? Criteria 12: Were the outcome assessors blinded to the exposure status of participants? Criteria 13: Was loss to follow-up after baseline 20% or less? Criteria 14: Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?" Symbols: + = yes; – = no; ? = cannot determine or not reported; / = not applicable. It is worth noting that the criterion related to the sufficiency of exposure time frame (criterion 7) was excluded for all studies. This decision was made due to discrepancies in the methodological approaches used and the limited theoretical foundation and empirical evidence regarding the duration of the impact of IPV exposure on children's self-regulation

Main Findings

Research Question 1: Associations Between IPV Exposure and Aspects of Self-Regulation

Among the 13 articles in the review (shown in Table 3), 10 studies identified significant negative effects of IPV exposure on self-regulation in children and adolescents ages ranging from 1 to 13 years. Out of 13 studies, 10 used longitudinal designs where IPV exposure was measured before the assessment of self-regulation (see Table 1). They reported a small to moderate effect size (based on available regression beta values in the article, the effect sizes ranged from 0.10 to 0.37). These studies were published between 2002 and 2021. The included studies examined three aspects of self-regulation: executive function, behavioral regulation, and emotional regulation. The association between IPV exposure and executive function was found to be significant in all three studies. Similarly, significant associations were observed between IPV exposure and behavioral regulation, as indicated by the findings across the three included studies. In the case of emotional regulation, out of the nine studies that investigated the association between IPV exposure and emotional regulation, six reported significant associations. One study by Maughan and Cicchetti (2002) did not find a significant effect of IPV exposure on children's emotional response patterns ($N = 139$). Similarly, Miller-Graf and Scheid (2021) reported a nonsignificant finding in their study; they had a cross-sectional design and included participants of diverse ages, but a relatively small sample size ($N = 37$). Given that both of these two studies had relatively small sample sizes, it is important to consider the potential limitations in statistical power when detecting the significance of the effects of IPV exposure on emotional regulation. Ehrensaft and Cohen (2012) conducted a study exploring the relationship between adolescents' exposure to IPV and their negative mood regulation. This study also yielded nonsignificant results.

Self-regulation was assessed using a variety of methods. Among the 13 studies, four employed direct assessments, where researchers evaluated a child's self-regulatory abilities through tasks or activities. Additionally, three studies relied on adult report scores (Martin & Clements, 2002; Miller-Graf & Scheid, 2021; Raver et al., 2015), while six studies utilized observations and coding of children's behaviors (Easterbrooks et al., 2018; Katz et al., 2007; Martin & Clements, 2002; Maughan & Cicchetti, 2002; Towe-Goodman et al., 2012; Zarling et al., 2013). Additionally, two studies employed biological markers as measures of self-regulation. In the context of self-regulation, biological markers include measures of physiological processes such as cardiac interbeat interval (Rigterink et al., 2010) and basal cortisol levels (a stress hormone; Towe-Goodman et al., 2012). These markers are used to understand the biological underpinnings and correlates of self-regulation, providing insights into the physiological mechanisms involved in regulating behavior, emotions, or cognitive processes (Towe-Goodman et al., 2012).

All three studies measuring *executive function* (EF) used a combination of EF tasks that are suitable for children ages 3–5. For example, the EF assessment battery was used in Halldorsdottir et al.'s (2019) study that measured children's EF (ages 3–5) using three inhibitory control tasks (Spatial Conflict Arrows, Silly Sounds Stroop, Animal Go/No-Go), two working memory tasks (Working Memory Span and Pick the Picture), and one attention-shifting task (Something's the Same) (Willoughby et al., 2012). Clark et al. (2021) used a series of timed EF tasks, including Parts A and B of the Trail Making Test (TMT; Broshek & Barth, 2000) and the Stroop Color and Word Test (SCWT; Stroop, 1935). Gustafsson et al. (2015) used three EF tasks: the day-night task (an inhibitory control), the backward digit span task (working memory), and the flexible item selection task (attention shifting). For the two studies that examined *behavioral regulation*, the Brief Infant-Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2007) was used in Easterbrooks et al. (2018) and Behavioral Observation of Children's Coping and Affect Regulation (CAR) was used in Martin and Clements (2002). Among the eight articles that examined *emotional regulation* in children, five studies used researchers' observation in lab settings. Towe-Goodman et al. (2012) used adrenocortical assessment and Rigterink et al. (2010) collected electrocardiogram data (EKG) via capturing Cardiac interbeat interval (IBI). Only one study used parent reports using the Social Competence Scale-Parent (SCS; Miller-Graff & Scheid, 2021). Adolescents' self-report on Negative Mood Regulation (NMR) scale was used in Ehrensaft and Cohen (2012) study. Eleven of the 13 studies employed multiple methods and informants when investigating the effects of IPV exposure on children's outcomes.

Research Question 2: The Timing of IPV Exposure

The timing of IPV exposure varied across different stages of development, including infancy (Easterbrooks et al., 2018; Towe-Goodman et al., 2012), early childhood (Clark et al., 2021; Gustafsson et al., 2015; Halldorsdottir et al., 2019; Katz et al., 2007; Maughan & Cicchetti, 2002; Martin & Clements, 2002; Raver et al., 2015), childhood (Miller-Gaff & Scheid, 2021; Rigterink et al., 2010; Zarling et al., 2013), and early adolescence (Ehrensaft & Cohen, 2012). All timings of IPV exposure in each study occurred were noted in Table 4. In terms of self-regulation, most studies focused

Table 2 Study and Methodological Characteristics of Included Studies (N = 13)

Study	Age	Ethnicity	Theory	Design	Sampling/ sample size (N)
Clark et al., 2021	4–6 years of age and 12–14 years of age	38.33% White; 36.67% Black/African American; 5% Latino/Hispanic; 20% biracial	Spillover Hypothesis	Longitudinal	Community sample enrolled in a trial for joint interventions (N = 120)
Easterbrooks et al., 2018	1–2 years of age	14% Black ;0.4% East Asian; 19% Multiracial; 1.4% Native American; 1.1% South Asian; 31.2% White; 33% Other;	N/A	Longitudinal	A state-wide paraprofessional home visiting program for first-time adolescent parents (N = 400)
Ehrensaft & Cohen, 2012	10–18 years of age	Sampled region with high proportions of Catholic (54%) and Caucasian (91%) participants	N/A	Longitudinal	Randomly selected sample residing in two upstate New York counties in 1,975 (Parents: N = 678; Children: N = 396)
Gustafsson et al., 2015	60 months	50.6% Black 49.4% White	Emotional Security Theory	Longitudinal	Subsample of the Durham Child Health and Development Study (DCHDS; socioeconomically and racially diverse families (N = 154)
Halldorsdottir et al., 2019	36, 48, and 60 months	56.9% Black 43.1% White	N/A	Longitudinal	Subsample from the Family Life Project (low-income, rural communities; N = 910)
Katz et al., 2007	9.5 years of age	5.1% Biracial/Multiracial 5.1% Black 89.9% White	Emotional Security Theory	Longitudinal	Community sample recruited through preschools, newspaper announcements, and offices of pediatricians and pediatric dentists (N = 82)
Martin & Clements, 2002	4 years of age	96% Anglo	Emotional Security Theory	Cross-sectional	Community sample in a semi-rural area in the Northeast (N = 48)
Maughan & Cicchetti, 2002	4–6 years of age	64.8 – 68.6% Black; 13.7 -23.9% White; 6.8 – 9.8% Latinx; 4.5 – 7.8% other	Emotional Security Theory	Cross-sectional	Low-income community sample (N = 139)
Miller-Graf & Scheid, 2021	3–14 years of age	43.5% Black; 39.1% White; 8.6% Biracial/Multiracial; 8.7% Others	N/A	Cross-sectional	Low-income community sample enrolled in a longitudinal study (N = 37)
Raver et al., 2015	6–58 months	Not specified	Emotional Security Theory	Longitudinal	Subsample from the Family Life Project (low-income, rural communities; N = 1,025)
Rigterink et al., 2010	4–9 years of age	4.8% Black 92.1% White 3.2% Multiracial/Multiethnic	N/A	Longitudinal	Community sample recruited through postings in doctors' offices, preschools, and newspaper advertisements (N = 68)
Towe-Goodman et al., 2012	2–7 months	25% Black 75% White	Emotional Security Theory	Longitudinal	Subsample from a Longitudinal study in rural, low-income communities (N = 735)
Zarling et al., 2013	6–8 years of age	17% Black; 7% Latinx; 10% Multiracial/Multiethnic; 2% Native American; 64% White	N/A	Longitudinal	Community sample from a longitudinal study of parenting and children's social development (N = 132).

Table 3 Summary of Critical Findings (N = 13)

Authors (year)	Effect	Statistics	Indirect Mediation effects /Moderation effects
Clark et al., 2021	Significant, indirect, and negative	$\beta = 0.37$, $p = .001$	Significant mediators: Maternal depression ($\beta = 0.329$, $p = .002$) and negative parenting ($\beta = 0.502$, $p < .001$)
Easterbrooks et al., 2018	Significant, direct, and negative	$p < .05$	Significant moderator: child maltreatment Nonsignificant moderators: maternal depression and child-rearing attitudes and behavior
Ehrensaft & Cohen, 2012	Nonsignificant, direct	$\beta = 0.08$, $p > .05$	N/A
Gustafsson et al., 2015	Significant, indirect, and negative	$\beta = 0.32$, $p = .02$	Significant mediator: maternal sensitivity
Halldorsdottir et al., 2019	Significant, indirect, and negative	$\beta = 0.25$, $p < .001$	Significant moderator: the presence of FK506 binding protein 5 (FKBP5) ($p = .037$) Significant mediator: prolonged stress-induced cortisol reactivity and emotional reactivity
Katz et al., 2007	Significant, direct, and negative	$r = .28/0.35$, $p < .01$	N/A
Martin & Clements, 2002	Significant, direct, and negative	$r = 35$, $p = .2$	N/A
Maughan & Cicchetti, 2002	Nonsignificant	$p > .5$	Nonsignificant moderator: maltreatment
Miller-Graf & Scheid, 2021	Nonsignificant	$p > .5$	N/A
Raver et al., 2015	Significant, direct, and negative	$\beta = 0.1$, $p < .05$	N/A
Rigterink et al., 2010	Significant, direct, and negative	$p < .05$	Nonsignificant moderator: child sex
Towe-Goodman et al., 2012	Significant, direct, and negative	$p < .05$	Significant moderator: child use of caregiver-oriented regulation strategies
Zarling et al., 2013	Significant, direct, and negative	$\beta = 0.34$, $p < .01$	N/A

on early childhood, with 9 of the 13 studies involving children younger than 6 years old, which is typically the age when children start elementary school. None of the research studies, however, were designed to show the cumulative detrimental effects of IPV exposure and its effects on altering the growth trajectories of regulatory capacity over time throughout childhood years due to a lack of measuring IPV and self-regulation at multiple timepoints.

Research Question 3: Mediating Mechanisms and Moderation Effects

Two of the 13 studies examined the mediating effect of parenting on the association between IPV and self-regulation. Specifically, these two studies identified IPV's significant negative indirect effects on EF through parenting level variables, including maternal depression (Clark et al., 2021), negative parenting practices (Clark et al., 2021), and maternal sensitivity (Gustafsson et al., 2015). In Clark et al.'s study (2021), the "Spillover Hypothesis" was used to guide the examination of the mediating role of parenting behaviors and parental mental health in the association between IPV exposure and self-regulation. This theory emphasizes the strain between parents that would modify parenting behaviors in negative directions when IPV is present, which in turn leads to compromised parental mental health and parenting that lead to a lower level of self-regulation. They discovered that the association between IPV exposure and speeded control, a facet of EF, was partially mediated by maternal depression and negative parenting. This suggests that these mediating factors accounted for a portion of the association between IPV exposure and speeded control, but there may still be a direct effect between IPV exposure and speeded control that is not fully explained by the mediating variables (Clark et al., 2021). In Gustafsson et al.'s (2015) study, Emotional Security Theory was used as the guiding theoretical framework, and they found that the association between IPV exposure and children's EF was fully mediated by maternal sensitive parenting behaviors. Overall, their findings suggested that compromised maternal mental health, parenting behaviors, and disturbances in the parent-child relationship are mechanisms through which IPV exposure affects levels of EF in children.

Several moderators were tested across five of the 13 studies. Specifically, the presence of FK506 binding protein 5 (FKBP5) (Halldorsdottir et al., 2019), child maltreatment (Easterbrooks et al., 2018), and caregiver-oriented regulation strategies (Towe-Goodman et al., 2012) were identified as significant moderators of the association between IPV exposure and self-regulation in children. However, child maltreatment was not found to be a significant moderator in Maughan and Cicchetti's (2002) study examining the relationship between IPV exposure and emotional response patterns. This study used lab observation on emotional regulation rather than home observation in Easterbrook et al.'s (2018) study. Other nonsignificant moderators were maternal depression (Easterbrooks et al., 2018), childrearing attitude and behavior (Easterbrooks et al., 2018), and child sex (Rigterink et al., 2010). Overall, these studies suggested that the negative impact of IPV exposure on children

Table 4 Characteristics of Measures Used in the Included Studies (N = 13)

	Measures of IPV Exposure				Measures of Self-Regulation			
Authors (year)	Source	Measure	Time of Measure	Type of IPV Exposure	Source	Measure	Time of Measure	Aspect of Self-Regulation
Clark et al., 2021	Mother report	CTS2	Ages 4–6 years at T1 and ages 12–14 at T2	Awareness of physical aggression	Direct assessments	EF tasks	T2, average age is 12.52 years	*Executive function*
Easterbrooks et al., 2018	Partner report	CTS2 & CTS-PC	Ages 1–2 years	Witnessed & experienced physical assault/ psychological	Home observation	Brief Infant-Toddler Social and Emotional Assessment	average age is 24.58 months	*Behavioral regulation*
Ehrensaft & Cohen, 2012	Parent report	CTS	Average age less than 12.8 years	Witnessed physical aggression	Self-report	Negative Mood Regulation (NMR) scale	Average age is 12.8 years	*Emotional regulation*
Gustafsson et al., 2015	Mother report	CTS	Ages 24, 30, and 36 months	Awareness of physical aggression	Direct assessments & questionnaires	EF tasks	Age 60 months	*Executive function*
Halldorsdottir et al., 2019	Caregiver report	CTS	Ages 7, 15, and 24 months	Witnessed physical/ psychological aggression	Direct assessments	EF Assessment Battery	Ages 36, 48, and 60 months	*Executive function & emotional regulation*
Katz et al., 2007	Parents' reports	CTS	Age 5 years	Awareness of physical violence	Interviews	Child and adolescent meta-emotion coding system	Ages 9.5 and 11 years	*Emotional regulation*
Martin & Clements, 2002	Parents' reports	CTS	Age 4 years	Awareness of physical aggression	Observations & teacher & parents' report	Behavioral Observation of Children's Coping and Affect Regulation (CAR)	Age 4 years	*Behavioral regulation*
Maughan & Cicchetti, 2002	Mother report	CTS	Average age 5.31 years	Witnessed verbal aggression & physical aggression	Lab observations	Five discrete emotional composite variables	Average age 5.31 years	*Emotional regulation*
Miller-Graf & Scheid, 2021	Mother report	CTS2	Average age 6.43 years	Youth witness aggression & Mother IPV victimization	Parent reports	Social Competence Scale-Parent	Average age 6.43 years	*Emotional regulation*
Raver et al., 2015	Parents' reports	CTS2	Ages 2, 6, 15, 24, 36, 48, and 58 months	Awareness of verbal aggression & physical aggression	Parent report	Strengths and Difficulties Questionnaire (SDQ).	Age 58 months	*Emotional regulation*
Rigterink et al., 2010	Parents' reports	CTS	T1, average age is 4.43 years and T2, average age is 9.03 years	Awareness of physical aggression	Interviews	Cardiac interbeat interval (IBI)	T1, average age is 4.43 years and T2, average age is 9.03 years	*Emotional regulation*
Towe-Goodman et al., 2012	Mother reports	CTS	Age 2 months	Awareness of verbal & physical aggression	Observations & saliva samples	Basal cortisol levels & the Infant Behavior Record	Age 7 months	*Emotional regulation*
Zarling et al., 2013	Mother & child reports	CTS2, CIPVI & CACI-2	T1, average age is 6.9 years	Witnessed & awareness physical/ psychological Aggression	Observations	Multiple scales and indicators	T1, average age is 6.9 years and T2, average age is 7.9 years	*Emotional dysregulation*

Note. CTS: Conflict Tactics Scale; CTS2: Revised Conflict Tactics Scale; JVQ: Juvenile Victimization Questionnaire; CIPVI: Context of Intimate Partner Violence Interview; CACI-2: Computer-Assisted Child Interview–2nd Edition; EF: executive function. Final selected studies were listed in inverse chronological order of publication

could be amplified in children with two copies of a risk FKBP5 haplotype (individuals who are more likely to have a developmental trajectory characterized by high, prolonged stress-induced cortisol reactivity and emotional reactivity in toddlerhood) and occurrence of child maltreatment (Easterbrooks et al., 2018). Towe-Goodman et al. (2012) examined the role of infants' caregiver-orientation strategy as a significant moderator in the relationship between IPV exposure and negative affect and basal cortisol levels. The findings from this study indicated that infants in the "high cortisol reactivity, moderate negative behavior" class were less likely to seek their mother or the home visitor as a means of regulating their distress compared to the "low reactors." However, this association was modest. They interpreted the results as in line with the idea that infants from violent households may be less inclined to seek caregiver attention, possibly due to the perceived dangers associated with interparental aggression.

Discussion

Main Findings

This review uses a systematic search and review methodology to synthesize 13 empirical studies that examined the association between IPV exposure and self-regulation in children and adolescents. Among the included articles, 9 studies identified significant longitudinal negative effects of IPV exposure on self-regulation for children and adolescents ranging from 2 months to 13. These studies suggest that the development of self-regulation in children may be disrupted in home environments characterized by IPV. Consequently, IPV exposure serves as a risk factor that heightens the likelihood of adverse developmental outcomes in self-regulation during childhood and adolescence.

The reviewed studies examined three key aspects of self-regulation: executive functioning, emotional regulation, and behavioral regulation. Various assessment approaches were utilized, including direct assessment, adult report scores, lab observations, and biological markers. Moderate effect sizes were found in studies that utilized direct assessment of executive functioning and lab observations of emotional dysregulation. Overall, across the 13 reviewed studies, the significance of the impact of IPV exposure on self-regulation was observed using various measurement approaches.

The developmental timing of IPV exposure and self-regulation development was a key focus in the reviewed studies. The majority of studies (10 out of 13) specifically examined self-regulation in early childhood, involving children younger than 6 years old, which coincides with the typical age when children begin elementary school. This emphasis on early childhood reflects the recognition of the critical period during which self-regulation skills are actively developing. By investigating self-regulation during this formative stage, these studies shed light on the potential impact of IPV exposure on the early developmental trajectories of children's self-regulation abilities. However, this review was unable to identify the timing of IPV exposure and its differentiated effects on self-regulation due to the lack of available studies that included multiple time point measures of both IPV and self-regulation. Infants and toddlers, who spend more time at home and have closer interactions with primary caregivers, are disproportionately more likely to be exposed to IPV. Therefore, it is crucial to investigate the timing of IPV exposure and its short and long-term effects on self-regulation. As highlighted by Raver et al. (2015), exposure to IPV may lead to adaptations in regulatory systems that prioritize short-term coping at the expense of long-term flexibility. The concept of a "sleeper effect" suggests that stronger associations between IPV exposure and negative outcomes may emerge at a later time point (Holmes, 2013). However, due to limitations in existing longitudinal research and the lack of repeated measures on IPV and self-regulation, we cannot observe the sensitive period of IPV exposure and its specific effects on the development of self-regulation. Further research with comprehensive longitudinal designs and multiple assessments is needed to address these gaps in knowledge.

Two studies revealed significant negative indirect effects of IPV on self-regulation, specifically EF, mediated by various parenting-related factors including maternal depression (Clark et al., 2021), negative parenting practices (Clark et al., 2021), and maternal sensitivity (Gustafsson et al., 2015). The compromised parental sensitivity and involvement associated with reduced mental health among mothers who are victims of IPV (Clark et al., 2021) align with McCoy's theory (2013), which posits that violence within households, particularly when directed at children's primary caregivers, can have a profound impact on children's ability to regulate themselves. It creates an environment where caregivers are unavailable to provide regulation when children experience distress, leaving them unable to develop effective self-regulation strategies. Children in homes with conflict and violence could miss the opportunity to learn regulatory skills from the caregiver as well as opportunities to explore, learn, take initiatives, and cope with challenges independently, all of which are processes considered necessary in internalizing skills for self-regulation (Drake et al., 2014). There is a need to consider other maternal factors when exploring the mechanisms of the negative impact of IPV exposure in future research, for example, as suggested by McCoy's theory, parents model self-regulatory techniques to facilitate children's development of cognitive schemas for self-regulation

(McCoy, 2013). When parents experience IPV, their compromised parenting behaviors may serve as ways of modeling ineffective regulatory behaviors. None of the reviewed studies, however, had examined this indirect pathway and thus these are possible areas for future inquiry.

With accumulating evidence suggesting the negative impact of IPV on self-regulation, it is important to establish the conditions under which effects of IPV exposure are lessened and intensified. Among the moderators examined in the reviewed studies, child maltreatment (Easterbrooks et al., 2018) and caregiver-oriented regulation strategies (Towe-Goodman et al., 2012) were found to be significant. Specifically, children who were exposed to severe psychological violence and experienced corporal punishment as a form of child maltreatment, presented lower levels of behavioral regulation as 2 years old (Easterbrooks et al., 2018). Considering IPV exposure as an early-life stressful event that may exert a differential impact on children based on individual characteristics/responses to the home environment, Halldorsdottir et al. (2019) examined genetic vulnerability to such adversity in children aged 36, 48, and 60 months, and found that children with two copies of a risk FKBP5 haplotype were more likely to present prolonged stress-induced cortisol and emotional reactivity in toddlerhood, followed by the reduced levels of executive function at a school-entering age. This study used longitudinal design and presented very unique gene × environment effects on the altered developmental trajectory of self-regulation in children. By investigating moderators such as child maltreatment and genetic vulnerability, these studies provide valuable insights into the individual characteristics and responses that may shape the impact of IPV exposure on self-regulation. They highlight the complex interplay between early-life stressors, genetic factors, and the home environment in influencing the developmental trajectory of self-regulation.

Notably, many children who were exposed to IPV demonstrated similar levels of emotional regulation compared to children without such exposure, as evidenced in studies by Maughan and Cicchetti (2002) and Miller-Graf and Scheid (2021). These children demonstrated resilience possibly by effectively implementing adaptive coping strategies, even in the face of the challenges they may have encountered due to IPV exposure. McCoy (2013) has highlighted several variables that contribute to the diverse outcomes observed in children exposed to violence, with emphasis on the influential role of the environmental context. For instance, the presence of secure emotional relationships with teachers and within their communities, caregiver's effective communication, warmth, supervision, and concern for children's well-being, as well as stable family relationships and routines. Those contextual factors could be protective, mitigating the negative effects of IPV exposure. Further empirical investigations are needed to explore these factors and their potential impact on children's outcomes.

Limitations of the Included Studies

Overall, the studies included in this review demonstrated good quality and substantial evidence documenting IPV's negative impact on self-regulation. Still, several limitations in the design, measure, and sampling yield a less comprehensive understanding of IPV's impact. Most of the studies in this review (11 out of 13) defined and measured IPV against caregivers and used a single variable indicating the prevalence of a combination of psychological aggression, physical assault, and sexual violence; the exception was Raver et al.'s (2015) study in which the effects of physical and verbal aggression were tested separately. The high reliance on self-report by parents precludes the understanding of the degree to which a child had been exposed to violence, which leads to the unsolved question of whether there is a differential effect of seeing, hearing, awareness, or involvement of IPV on children's self-regulation. Children's reports were only used in one study (Zarling et al., 2013). Zarling et al. (2013) measured IPV exposure most comprehensively using both rating questions and coded narratives, and they interviewed both mothers and children. The most common questionnaires measuring IPV were the Conflict Tactics Scale (8 out of 13; Straus et al., 1996) and the Revised Conflict Tactics Scale (5 out of 13; Straus et al., 1996; Straus & Douglas, 2004). These two measures are the most frequently used in the IPV literature for evaluating both victimization and perpetration. Using these two measures, the studies treated the presence of IPV at home as an indication of children's exposure to IPV. Future research should aim to diversify measurement approaches to expand beyond the current reliance on self-reporting and maternal reports. It is crucial to incorporate multiple perspectives, including children's reports, observations, and objective measures, in order to achieve a more comprehensive and accurate assessment of the frequency, severity, and types of violence exposure.

Second, the findings from the studies should be carefully generalized to a wider population beyond U.S. families. All the studies included in this review were conducted in the U.S. From the race/ethnicity information provided by these studies, six studies presented the proportion of race/ethnicity in the sample with white as the majority; two studies had a relatively equal proportion between white and Black (Gustafsson et al., 2015; Halldorsdottir et al., 2019). However, the effect size of IPV's impact was not discussed in comparisons between the two racial/ethnic groups. Additionally, although several studies purposefully focused on underserved communities, such as low-income rural

families (Halldorsdottir et al., 2019; Raver et al., 2015) or subsamples from the historical and geographical regions with chronic rural poverty (Towe-Goodman et al., 2012), the limited inclusion of underrepresented populations in the literature is linked to a recent call from the field to focus on children and families who have experienced long-term marginalization and discrimination within communities because of race, ethnicity, gender, and sexual orientation (Tajima, 2021). Future research should also be more diversified in selecting measurements with the consideration of language and adaptation towards diverse communities (Bent-Goodley, 2021). For example, the composite Abuse Scale-Revised, Short Form (CAS-R SF) had been validated in a diverse race or ethnicity sample, such as indigenous populations in Canada (Ford-Gilboe et al. 2016) that could be an additional instrument to be used to assess IPV.

Lastly, as Tajima (2021) suggested, researchers should consider intersectionality (Crenshaw, 1991), which emphasizes that diverse and distinct social identities (e.g., race, ethnicity, gender, SES, indigeneity, etc.) could be interrelated to affect an individual's risks of being exposure to IPV. In the current reviewed article, there was a notable absence of consideration for factors like immigration status, sexual orientation, and nontraditional family structures in the sampling of participants. These factors are associated with elevated risks and may result in moderating effects of IPV exposure, considering differential access to support, opportunities, treatment, and social networks. By considering intersecting social identities, researchers can gain a more comprehensive understanding of how multiple forms of oppression and discrimination intersect with IPV that influence children's experiences and outcomes. This approach can provide valuable insights into the unique challenges faced by individuals with intersecting identities and inform the development of tailored interventions and support systems that address their specific needs.

Strengths and Limitations of the Current Review

This review used systematic search techniques to identify and assess the quality of the included 13 studies published between 2000 and 2022. From this systematic review, we summarized current literature on IPV exposure and self-regulation in children and adolescents. Both significant and nonsignificant mediators and moderators were extracted and analyzed. This study included a broad search of interchangeably used IPV terms from the past two decades (e.g., domestic violence, family violence, and interparental conflict) and various aspects of self-regulation in children and adolescents. To our knowledge, this is the first systematic review focusing on IPV exposure and self-regulation. This study fills gaps in the review literature and sheds light on the specific associations between IPV exposure and self-regulation. The synthesis of findings from the included studies and establishing a clear link between IPV exposure and poorer self-regulation, this review also highlights the critical importance of addressing and eliminating children's exposure to violence within their homes.

Two limitations need to be noted. First, the final list of the studies only included the published work in peer-reviewed English-written journals. One bias created by this was that the nonsignificant findings kept in the unpublished work were not weighted in the general conclusions of this review. Secondly, meta-analyses were not conducted due to the non-uniformity of conceptualization and operationalization on both IPV and self-regulation variables across studies. Specifically, as listed in Table 4, we observed the heterogeneity of research design, the varied conceptualization of IPV exposure, different aspects and measures of self-regulation, and varied age groups of children being studied, all of which limited the capacity of conducting meta-analyses using the results from this list of reviewed studies.

Implications

Implications for practice, policy, and research are displayed in Table 5. Given the increasing number of children exposed to IPV in the U.S., particularly during the COVID-19 pandemic (e.g., Bhuptani et al., 2022; Boserup et al., 2020), policymakers and practitioners need to pay attention to the consequential adverse effects of IPV on children's social-emotional development. The current review highlights the

Table 5 Summary of Implications for Practice, Policy, and Research

Type	Implications
Practice	• Promote early prevention to reduce interparental violence, particularly among families from diverse, disadvantaged, and underrepresented socioeconomic backgrounds.
Policy	• Implement prevention programs with the emphasis on raising family members' awareness of the different types of IPV, which would strengthen conversation and advocacy between community leaders and local county executives • Widen the adoption of pre-kindergarten programs or Head Start programs in school districts could provide social-emotional support for children who live in a household with interparental IPV through an early entry into school.
Research	• Uncover mechanisms and processes of IPV's impact on self-regulation • Identify concurrent and consecutive risk factors (e.g., poverty; child abuse) in violent family contexts and consider incorporating other potential comorbidity violence exposure at the community level (e.g., neighborhood violence, social networking violence).

importance of an increased understanding and awareness of violence in families that negatively affect children's regulatory processes. The findings call for prevention programs with a holistic perspective to reduce family violence and bolster children's development of self-regulation. For instance, IPV prevention programs can take a community-based approach that takes into account socioeconomic diversity and the unique characteristics of various communities within the U.S. (Yoshihama et al., 2012). For early child abuse identification and intervention in-home visiting programs, such as the Nurse-Family Partnership Program (Kirkland et al., 2020; Olds et al., 1997), sessions could be implemented on topics about interparental violence and the consequences for children, as an addition to the ones targeting the direct violence and abuses on children. For instance, nurses serving as home visitors could receive training to identify signs of IPV and collaborate with families to enhance their understanding of the impacts of IPV exposure on children's cognitive and emotional development.

This review also highlighted the necessity to implement intervention programs to support children who have experienced interparental violence. Specifically, it is essential to call for social workers, clinicians, and therapists to pay attention to the needs of children witnessing IPV. For example, trauma-informed play therapy could be implemented encouraging children's expression of their emotions and feelings through non-verbal techniques (e.g., Kot et al., 1998; Woollett et al., 2020). It is also vital to create intervention programs from a family system perspective to recognize the role of the parent-child relationships in developing adaptive behaviors in children. For example, therapists could facilitate child-parent psychotherapy between mother/father and children to target the provision of a safe and supportive environment for children and ultimately promote affect regulation (Lieberman et al., 2005). As part of a comprehensive support system, which includes trained professionals and educators, classroom-based mindfulness training incorporating mindful yoga can offer valuable benefits to preschoolers who have been exposed to IPV (Razza et al., 2015). Mindful yoga practices integrated into the school environment can be particularly helpful in addressing the emotional and behavioral challenges that may arise from IPV exposure through reducing stress, improving focus and attention, and building resilience. Lastly, the findings from this review underscore the importance of examining the underlying processes to gain a better understanding of how IPV influences children's self-regulation. Our findings highlight the potential mediation pathways of parenting practices and maternal mental health. Interventions and programs aimed at promoting positive parenting, such as fostering affectionate and sensitive interactions with children, along with consistent and effective discipline strategies, hold promise in promoting children's regulatory skills. Additionally, addressing parenting stress and providing support to mothers who are victims of IPV and exhibit early signs of depression is crucial.

Conclusion

The overall findings of this review demonstrate the substantial association between IPV exposure and lower levels of self-regulation in children and adolescents. Among the 13 studies included in this review, 10 identified significant direct negative effects, while two studies identified significant negative indirect effects. The evidence from longitudinal pathway models in these studies highlights the role of compromised positive parenting practices and increased depressive symptoms in mothers who have experienced IPV as potential mediating mechanisms. These findings underscore the urgent need for prevention strategies aimed at minimizing children's exposure to IPV and interventions to support those children and families who have already been exposed. Implementing effective prevention measures can help reduce the adverse impact of IPV on children's self-regulation and promote healthier developmental outcomes. Additionally, timely interventions for children who have experienced IPV can mitigate delays in the development of self-regulation and promote resilience.

Declarations

Conflict of interest The authors have no conflict of interest to declare that are relevant to this article.

References

Bender, A. E., McKinney, S. J., Schmidt-Sane, M. M., Cage, J., Holmes, M. R., Berg, K. A., & Voith, L. A. (2022). Childhood exposure to intimate partner violence and effects on social-emotional competence: A systematic review.Journal of Family Violence,37(8),1263–1281.https://doi.org/10.1007/s10896-021-00315-z.

Bent-Goodley, T. (2021). Diversity in interpersonal violence research. Journal of Interpersonal Violence,36(11–12),4937–4952.https://doi.org/10.1177/08862605211013003.

Berg, K. A., Evans, K. E., Powers, G., Moore, S. E., Steigerwald, S., Bender, A. E., & Connell, A. M. (2022). Exposure to intimate partner violence and children's physiological functioning: A systematic review of the literature.Journal of Family Violence, 37(8),1321–1335.https://doi.org/10.1007/s10896-022-00370-0.

Bhuptani, P. H., Hunter, J., Goodwin, C., Millman, C., & Orchowski, L. M. (2022). Characterizing intimate Partner violence in the United States during the COVID-19 pandemic: A systematic review. *Trauma Violence & Abuse*, *0*(0), https://doi.org/10.1177/15248380221126187.

Blair, C. (2010). Stress and the development of self-regulation in context.Child development perspectives,4(3),181–188.https://doi.org/10.1111/j.1750-8606.2010.00145.x.

Blair, C., & Ku, S. (2022). A hierarchical integrated model of self-regulation.Frontiers in Psychology,13,725–828.https://doi.org/10.3389/fpsyg.2022.725828.

Boserup, B., McKenney, M., & Elkbuli, A. (2020). Alarming trends in US domestic violence during the COVID-19 pandemic.The American journal of emergency medicine,38(12),2753.https://doi.org/10.1016/j.ajem.2020.04.077.

Boutwell, B. B., & Beaver, K. M. (2010). The intergenerational transmission of low self-control.Journal of Research in Crime and Delinquency,47(2),174–209.https://doi.org/10.1177/0022427809357715.

Bowlby, J. (1988). *A secure base: Parent-child attachment and healthy human development*. Basic Books.

Breiding, M., Basile, K. C., Smith, S. G., Black, M. C., & Mahendra, R. R. (2015). Intimatepartnerviolencesurveillance:Uniformdefinitionsandrecommendeddataelements.Version2.0.

Briggs-Gowan, M. J., & Carter, A. S. (2007). Applying the infant-toddler social & emotional assessment (ITSEA) and brief-ITSEA in early intervention.Infant Mental Health Journal,28(6),564–583.https://doi.org/10.1002/imhj.20154.

Bronfenbrenner, U. (1979). Contexts of child rearing: Problems and prospects.American psychologist,34(10),844.https://doi.org/10.1037/0003-066X.34.10.844.

Bronfenbrenner, U., Arastah, J., Hetherington, M., Lerner, R., Mortimer, J. T., Pleck, J. H., Pulkinnen, L., Rutter, M., Schneewind, K., & Slaughter, D. (1986). Ecology of the family as a context for human development: Research perspectives.Developmental Psychology,22(6),723.https://doi.org/10.1037/0012-1649.22.6.723.

Broshek, D. K., & Barth, J. T. (2000). The Halstead-Reitan Neuropsychological Test Battery.https://doi.org/10.1037/t00275-000.

Carpenter, G. L., & Stacks, A. M. (2009). Developmental effects of exposure to intimate partner violence in early childhood: A review of the literature.Children and Youth Services Review,31(8),831–839.https://doi.org/10.1016/j.childyouth.2009.03.005.

Chiesa, A. E., Kallechey, L., Harlaar, N., Ford, C. R., Garrido, E. F., Betts, W. R., & Maguire, S. (2018). Intimate partner violence victimization and parenting: A systematic review. Child abuse & neglect,80,285–300.https://doi.org/10.1016/j.chiabu.2018.03.028.

Clark, H. M., Grogan-Kaylor, A. C., Galano, M. M., Stein, S. F., & Graham-Bermann, S. A. (2021). Preschoolers' intimate partner violence exposure and their speeded control abilities eight years later: A longitudinal mediation analysis:Journal of Interpersonal Violence.https://doi.org/10.1177/08862605211035883.

Crenshaw, K. W. (1991). Mapping the margins: Intersectionality, identity politics, and violence against women of color. Stanford Law Review, 43(6), 1241–1299. https://doi.org/10.2307/1229039

Cummings, E. M., El-Sheikh, M., Kouros, C. D., & Buckhalt, J. A. (2009). Children and violence: The role of children's regulation in the marital aggression-child adjustment link.Clinical Child and Family Psychology Review,12(1),3–15.https://doi.org/10.1007/s10567-009-0042-7.

Davies, P. T., & Cummings, E. M. (1994). Marital conflict and child adjustment: An emotional security hypothesis.Psychological bulletin, 116(3),387.https://doi.org/10.1037/0033-2909.116.3.387.

Demir-Lira, Ö. E., Voss, J. L., O'Neil, J. T., Briggs-Gowan, M. J., Wakschlag, L. S., & Booth, J. R. (2016). Early-life stress exposure associated with altered prefrontal resting-state fMRI connectivity in young children.Developmental Cognitive Neuroscience,19,107–114.https://doi.org/10.1016/j.dcn.2016.02.003.

Drake, K., Belsky, J., & Fearon, R. M. (2014). From early attachment to engagement with learning in school: The role of self-regulation and persistence.Developmental psychology, 50(5),1350.https://doi.org/10.1037/a0032779.supp.

Easterbrooks, M. A., Katz, R. C., Kotake, C., Stelmach, N. P., & Chaudhuri, J. H. (2018). Intimate partner violence in the first 2 years of life: Implications for toddlers' behavior regulation. Journal of Interpersonal Violence,33(7),1192–1214.https://doi.org/10.1177/0886260515614562.

Ehrensaft, M. K., & Cohen, P. (2012). Contribution of family violence to the intergenerational transmission of externalizing behavior.Prevention Science,13(4),370–383.https://doi.org/10.1007/s11121-011-0223-8.

Evans, S. E., Davies, C., & DiLillo, D. (2008). Exposure to domestic violence: A meta-analysis of child and adolescent outcomes. Aggression and Violent Behavior,13(2),131–140.https://doi.org/10.1016/j.avb.2008.02.005.

Farver, J. A. M., Xu, Y., Eppe, S., Fernandez, A., & Schwartz, D. (2005). Community violence, family conflict, and preschoolers' socioemotional functioning.Developmental Psychology, 41(1),160.https://doi.org/10.1037/0012-1649.41.1.160.

Fong, V. C., Hawes, D., & Allen, J. L. (2019). A systematic review of risk and protective factors for externalizing problems in children exposed to intimate partner violence.Trauma, Violence, & Abuse,20(2),149–167.https://doi.org/10.1177/1524838017692383.

Ford-Gilboe, M., Wathen, C. N., Varcoe, C., MacMillan, H. L., Scott-Storey, K., Mantler, T., & Perrin, N. (2016). Development of a brief measure of intimate partner violence experiences: The composite abuse scale (Revised)—Short form (CASR-SF).BMJ open,6(12).https://doi.org/10.1136/bmjopen-2016-012824.

Fox, S. E., Levitt, P., & Nelson, I. I. I. (2010). C.A.How the timing and quality of early experiences influence the development of brain architecture.Child development, 81(1),28–40.https://doi.org/10.1111/j.1467-8624.2009.01380.x.

Gustafsson, H. C., Coffman, J. L., & Cox, M. J. (2015). Intimate partner violence, maternal sensitive parenting behaviors, and children's executive functioning.Psychology of Violence,5(3),266–274.https://doi.org/10.1037/a0037971.

Halldorsdottir, T., Kurtoic, D., Müller-Myhsok, B., Binder, E. B., & Blair, C. (2019). Neurobiology of self-regulation: Longitudinal influence of FKBP5 and intimate partner violence on emotional and cognitive development in childhood.American Journal of Psychiatry,176(8),626–634.https://doi.org/10.1176/appi.ajp.2019.18091018.

Harding, H., Morelen, D., Thomassin, K., Bradbury, L., & Shaffer, A. (2013). Exposure to maternal- and paternal-perpetrated intimate partner violence, emotion regulation, and child outcomes. Journal of Family Violence,28(1),63–72.https://doi.org/10.1007/s10896-012-9487-4.

Holmes, M. R. (2013). The sleeper effect of intimate partner violence exposure: Long-term consequences on young children's aggressive behavior.Journal of child psychology and psychiatry,54(9),986–995.https://doi.org/10.1111/jcpp.12071.

Howell, K. H., Barnes, S. E., Miller, L. E., & Graham-Bermann, S. A. (2016). Developmental variations in the impact of intimate partner violence exposure during childhood.Journal of Injury and Violence Research, 8(1),43.https://doi.org/10.5249/jivr.v8i1.663.

Ingoldsby, E. M., Shaw, D. S., Owens, E. B., & Winslow, E. B. (1999). A longitudinal study of interparental conflict, emotional and behavioral reactivity, and preschoolers' adjustment problems among low-income families.Journal of abnormal child psychology, 27(5),343–356.https://doi.org/10.1023/A:1021971700656.

Katz, L. F., Hessler, D. M., & Annest, A. (2007). Domestic violence, emotional competence, and child adjustment.Social Development,16(3),513–538.https://doi.org/10.1111/j.1467-9507.2007.00401.x.

Kirkland, K., Lee, E., Smith, C., & Greene, R. (2020). Sustained impact on parenting practices: Year 7 findings from the healthy families New York randomized controlled trial. Prevention Science,21(4),498–507.https://doi.org/10.1007/s11121-020-01110-w.

Kopp, C. B. (1982). Antecedents of self-regulation: A developmental perspective.Developmental psychology, 18(2),199.https://doi.org/10.1037/0012-1649.18.2.199.

Kot, S., Landreth, G. L., & Giordano, M. (1998). Intensive child-centered play therapy with child witnesses of domestic violence.International Journal of Play Therapy, 7(2),17.https://doi.org/10.1037/h0089421.

Krishnakumar,A.,&Buehler,C.(2000).Interparentalconflictandparenting behaviors: A meta-analytic review.Family relations,49(1),25–44.https://doi.org/10.1111/j.1741-3729.2000.00025.x.

Levendosky, A. A., Leahy, K. L., Bogat, G. A., Davidson, W. S., & von Eye, A. (2006). Domestic violence, maternal parenting, maternal mental health, and infant externalizing behavior.Journal of Family Psychology,20(4),544–552.https://doi.org/10.1037/0893-3200.20.4.544.

Lieberman, A. F., Van Horn, P., & Ippen, C. G. (2005). Toward evidence-based treatment: Child-parent psychotherapy with preschoolers exposed to marital violence.Journal of the American Academy of Child & Adolescent Psychiatry, 44(12),1241–1248.https://doi.org/10.1097/01.chi.0000181047.59702.58.

Martin, S. E., & Clements, M. L. (2002). Young children's responding to interparental conflict: Associations with marital aggression and child adjustment.Journal of Child and Family Studies, 11(2),231–244.https://doi.org/10.1023/A:1015133827129.

Maughan, A., & Cicchetti, D. (2002). Impact of child maltreatment and interadult violence on children's emotion regulation abilities and socioemotional adjustment.Child Development,73(5),1525–1542.https://doi.org/10.1111/1467-8624.00488.

McClelland, M. M., & Tominey, S. L. (2014). The development of self-regulation and executive function in Young Children.Zero to Three,35(2).

Mccoy, D. C. (2013). Early violence exposure and self-regulatory development: A bioecological systems perspective.Human Development,56,254–273.https://doi.org/10.1159/000353217.

Miller-Graff, L., & Scheid, C. (2021). Attentionalbiastothreat:examiningassociationswithchildren'semotionalregulationandinteractionswithintimatepartnerviolence.*Child Psychiatry and Human Development*,*0123456789*.https://doi.org/10.1007/s10578-021-01238-y.

Montroy, J. J., Bowles, R. P., Skibbe, L. E., McClelland, M. M., & Morrison, F. J. (2016). The development of self-regulation across early childhood.Developmental Psychology, 52(11),1744–1762.https://doi.org/10.1037/dev0000159.

Mueller, I., & Tronick, E. (2019). Early life exposure to violence: Developmental consequences on brain and behavior.Frontiers in behavioral neuroscience, 13,156.https://doi.org/10.3389/fnbeh.2019.00156.

National Institutes of Health (2014). Quality assessment tool forobservational cohort studies and cross-sectional studies.https://www.nhlbi.nih.gov/health-topics/study-quality-assessment-tools.

Nigg, J. T. (2017). Annual Research Review: On the relations among self-regulation, self-control, executive functioning, effortful control, cognitive control, impulsivity, risk-taking, and inhibition for developmental psychopathology.Journal of Child Psychology and Psychiatry, 58(4),361–383.https://doi.org/10.1111/jcpp.12675.

Olds, D. L., Eckenrode, J., Henderson, C. R. J., Kitzman, H., Powers, J., Cole, R., Sidora, K., Morris, P., Pettitt, L. M., & Luckey, D. (1997). Long-term effects of home visitation on maternal life course and child abuse and neglect: Fifteen-year follow-up of a randomized trial.Journal of the American Medical Association,278(8),637–643.https://doi.org/10.1001/jama.1997.03550080047038.

Raver, C. C., Blair, C., Garrett-Peters, P., Vernon-Feagans, L., Greenberg, M., Cox, M., Burchinal, P., Willoughby, M., Mills-Koonce, R., & Ittig, M. (2015). Poverty, household chaos, and interparental aggression predict children's ability to recognize and modulate negative emotions.Development and Psychopathology,27(3),695–708.https://doi.org/10.1017/S0954579414000935.

Razza, R. A., Bergen-Cico, D., & Raymond, K. (2015). Enhancing preschoolers' self-regulation via mindful yoga.Journal of Child and Family Studies,24(2),372–385.https://doi.org/10.1007/s10826-013-9847-6.

Rigterink, T., Katz, L. F., & Hessler, D. M. (2010). Domestic violence and longitudinal associations with children's physiological regulation abilities.Journal of Interpersonal Violence,25(9),1669–1683.https://doi.org/10.1177/0886260509354589.

Roskam, I., Stievenart, M., Meunier, J. C., & Noël, M. P. (2014). The development of children's inhibition: Does parenting matter?Journal of Experimental Child Psychology, 122,166–182.https://doi.org/10.1016/j.jecp.2014.01.003.

Schore, A. N. (2005). Attachment, affect regulation, and the developing right brain: Linking developmental neuroscience to pediatrics.Pediatrics in review, 26(6),204–217.https://doi.org/10.1542/pir.26-6-204.

Straus, M. A., & Douglas, E. M. (2004). A short form of the revised conflict tactics Scales, and typologies for severity and mutuality.Violence and victims, 19(5),507–520.https://doi.org/10.1891/vivi.19.5.507.63686.

Straus, M. A., Hamby, S. L., Boney-McCoy, S. U. E., & Sugarman, D. B. (1996). The revised conflict tactics scales (CTS2) development and preliminary psychometric data.Journal of Family Issues, 17(3),283–316.https://doi.org/10.1177%2F019251396017003001.

Stroop, J. R. (1935). Studies of interference in serial verbal reactions.Journal of experimental psychology, 18(6),643.https://doi.org/10.1037/h0054651.

Tajima, E. A. (2021). First, do no harm: From diversity and inclusion to equity and anti-racism in interpersonal violence research and scholarship.Journal of Interpersonal Violence,36(11–12),4953–4987.https://doi.org/10.1177/08862605211012999.

Taylor, S. E., Eisenberger, N. I., Saxbe, D., Lehman, B. J., & Lieberman, M. D. (2006). Neural responses to emotional stimuli are associated with childhood family stress. Biological Psychiatry,60(3),296–301.https://doi.org/10.1016/j.biopsych.2005.09.027.

Towe-Goodman, N. R., Stifter, C. A., Mills-Koonce, W. R., & Granger, D. A. (2012). Interparental aggression and infant patterns of adrenocortical and behavioral stress responses.Developmental Psychobiology,54(7),685–699.https://doi.org/10.1002/dev.20618.

Vu, N. L., Jouriles, E. N., McDonald, R., & Rosenfield, D. (2016). Children's exposure to intimate partner violence: A meta-analysis of longitudinal associations with child adjustment problems. Clinical psychology review,46,25–33.https://doi.org/10.1016/j.cpr.2016.04.003.

Werchan, D. M., Ku, S., Berry, D., & Blair, C. (2022). Sensitive caregiving and reward responsivity: A novel mechanism linking parenting and executive functions development in early childhood.Developmental Science,e13293.https://doi.org/10.1111/desc.13293.

Willoughby, M. T., Kupersmidt, J. B., & Voegler-Lee, M. E. (2012). Is preschool executive function causally related to academic achievement?Child Neuropsychology,18(1),79–91.https://doi.org/10.1080/09297049.2011.578572.

Woollett, N., Bandeira, M., & Hatcher, A. (2020). Trauma-informedartandplaytherapy:PilotstudyoutcomesforchildrenandmothersindomesticviolencesheltersintheUnitedStatesandSouthAfrica.*Child Abuse and Neglect*,*107*.https://doi.org/10.1016/j.chiabu.2020.104564.

Yoshihama, M., Ramakrishnan, A., Hammock, A. C., & Khaliq, M. (2012). Intimate partner violence prevention program in an asian immigrant community: Integrating theories, data, and community.Violence Against Women,18(7),763–783.https://doi.org/10.1177/1077801212455163.

Zarling, A. L., Taber-Thomas, S., Murray, A., Knuston, J. F., Lawrence, E., Valles, N. L., DeGarmo, D. S., & Bank, L. (2013). Internalizing and externalizing symptoms in young children exposed to intimate partner violence: Examining intervening processes.Journal of Family Psychology,27(6),945–955.https://doi.org/10.1037/a0034804.